STATEMENT OF BASIS

Minor Air Quality Permit

Berry Plastics Corporation

Sioux Falls, South Dakota

South Dakota
Department of Environment and Natural Resources

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1.0 BACKGROUND

On January 20, 2004, Berry Plastics Corporation (formerly Tyco Plastics and Covalence Specialty Materials) submitted an application for an air quality operating permit for their fabricated plastic products plant in Sioux Falls, South Dakota. A minor air quality permit was issued on June 7, 2005.

Berry Plastics manufactures polyethylene plastic bags and custom-blend film. The primary SIC code for the facility is 2673 (plastics, foil, and coated paper products). The secondary SIC code is 3081 (unsupported plastic fill).

Raw material arrives at the facility by rail and trucks. The raw material is removed from the railcars by a vacuum system and blower into a storage silo. The raw material is in the form of plastic resin beads approximately 4 millimeters in diameter. The plastic resin beads are transported from the storage silo to the extrusion lines by a vacuum system. The process of transporting the raw material from the rail cars and trucks to the storage silo does not involve a point source. Therefore, the particulate emissions from this process are considered fugitive emissions. The raw polyethylene plastic pellets are heated and extruded to produce bags and other similar products.

On January 25, 2010 Berry Plastics Corporation submitted an application to alter their operations by adding four extrusion lines, adding three printers, and removing 16 printers. On March 26, 2010 additional information was submitted to the Department for review.

There have been no complaints or violations filed against this facility since the last permit review.

2.0 OPERATIONAL DESCRIPTION

2.1 Existing Operations

Table 2-1 provides a description of the permitted units, which was derived from the existing permit.

Table 2-1 Description of Permitted Units, Operations, and Processes

Unit	Description	Maximum Operating Rate	Control Device
#1	Forty-three electrically heated extrusion lines. Two additional extruders may be installed during the term of this permit. The extruders are either blown film or internal bubble cooling. The extrusion lines exhaust to general ventilation or a vent associated with a particular extruder.	Not applicable	Not applicable

Unit	Description	Maximum Operating Rate	Control Device
#2	Twenty-four printers including two Algen 36-inch box printers; seventeen flexographic printers: nine 4-inch Matthews Model 5324, two 12-inch Matthews Model 5124, one 18-inch KIWI, three 18-inch Bellmark, and three 4-inch OMAL printers; and four inkjet printers.	Not applicable	Not applicable
#3	Sixteen corona treaters.	Not applicable	Not applicable

2.2 Proposed Equipment

On January 25, 2010, Berry Plastics Corporation submitted an application to add equipment to the facility. Table 2-2 illustrates the proposed addition of equipment to be listed in the air quality permit.

Table 2-2 Description of Proposed Equipment

Unit	Description	Maximum Operating Rate	Control Device
#1	Four extrusion lines	Not applicable	Not applicable
#2	Two 18-inch Bellmark flexographic printers and one 13-inch Matthews printer	Not applicable	Not applicable

3.0 EMISSION FACTORS

DENR uses stack test results to determine air emissions whenever stack test data is available from the source or a similar source. When stack test results are not available, DENR relies on manufacturing data, material balance, EPA's Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1) document, the applicant's application, or other methods to determine potential air emissions.

3.1 Printing Operations

The flexographic printers will use a solvent-based ink with Barsol™ solvent as an ink-thinner and cleaning solvent. As a conservative estimate, it is assumed that 100 percent of the volatile organic compounds (VOCs) in the ink and solvent are emitted from the printing operations.

The potential VOC emissions for the solvent-based printing operations are based on the printing width, maximum line speed, and a VOC emission factor of 4.25×10^{-4} pound per square foot. The VOC emission factor is based on the solvent-based ink with the highest VOC content used and an applied thickness of 0.1 mils. The maximum estimated product coverage achievable with solvent-based inks and thinners is approximately 12.5 percent. The solvent-based inks and Barsol™ solvent do not contain any hazardous air pollutants (HAPs). Table 3-1 provides the printer specifications for the three new printers.

Table 3-1 Printer Specifications

Printer	Model	Actual Printing Width (in.)	Maximum Line Speed (ft/min)	Maximum VOC Application Rate (lb/sq. ft.)	Maximum Coverage Rate (%)
Matthews	Flexographic	13.0	450	0.000425	12.5
Bellmark	Flexographic	17.5	300	0.000425	12.5

3.2 Extrusion Operations

The facility currently operates 43 extrusion lines and has proposed to add four more lines. Berry Plastics performed a literature search for their 2007 facility permit application to determine the appropriate emission factors for polyethylene extrusion. Emission factors from in-house air emissions testing on operating extrusion processes at several Mobil Chemical facilities were determined to be most applicable to Berry Plastics' operations. The emission factors for particulate matter, VOC, and HAP emission factors for internal bubbling cooling and blown film extrusion are found in Table 3-2.

Table 3-2 Extrusion Emission Factors

	Internal Bubble Cooler, lbs per MM lbs resin	Blown Film Extrusion, lbs per MM lbs resin	Blown Film Extrusion (high density), lbs per MM lbs resin
Particulate Matter	**300**	**150**	**5**
VOCs	**169**	**85**	**383**
Hazardous Air Pollutants			
Acetaldehyde	0.26	0.13	0.07
Acetophenone	1.15	0.58	--
Ethylbenzene	0.27	0.14	--
Formaldehyde	1.13	0.57	0.07
Hexane	4.00	2.00	72.67
Methyl Ethyl Ketone	1.15	0.58	--
Naphthalene	0.13	0.07	--
Propionaldehyde	1.15	0.58	--
Styrene	0.18	0.09	0.04
Toluene	0.57	0.29	3.50
Xylene	0.59	0.30	0.10
Total HAPs	**10.58**	**5.33**	**76.45**

The additional extrusion lines are described in Table 3-3.

Table 3-3 Extrusion Line Specifications

Line Number	Type	Max Annual Throughput (MMlbs)
Line # 145	Blown Film	4.1
Line # 500	Internal Bubble Cooler	7.4
Proposed Line	Internal Bubble Cooler	4.0
Proposed Line	Internal Bubble Cooler	7.0

4.0 POTENTIAL EMISSIONS

Potential uncontrolled emissions for each applicable pollutant are calculated from the maximum design capacity listed in the application and assuming the unit operates every hour of every day of the year. Potential uncontrolled emissions are not realistic of the actual emissions and are used only to identify which air quality permit(s) and state and federal regulations are applicable.

4.1 Potential Emission Estimates

Potential emissions are based on operating at full capacity, 24 hours per day, 7 days per week unless there are enforceable permit conditions that restrict the operations below the maximum capacity of the unit or hours of operation. There is no control equipment associated with the printer.

Equation 4-1 was used to estimate the potential VOCs emissions from the proposed printers and the results are displayed in Table 4-1.

Equation 4-1 – Potential Printing Volatile Organic Compound Emissions

$$Potential\ \frac{tons}{yr} = \text{Printing width}\ (in) \times \frac{1\,ft}{12\ in} \times line\ speed\ \frac{ft}{\min} \times \frac{60\min}{1\ hr} \times VOC\ App\ Rate\ \frac{lb}{ft^2} \times Coverage\ \ Rate\ (\%) \times \frac{1}{100} \times 8760\ \frac{hrs}{yr} \times \frac{1}{2000}\ \frac{ton}{lbs}$$

Emissions due to extrusion line processes are calculated by adding the entire maximum annual throughput from all extrusion lines and multiplying it by the emission factors located in Table 3-2. Potential emissions from the proposed extrusion operations are displayed in Table 4-1.

Berry Plastics Corporation's potential emissions from the existing operations were taken from the April 2005 statement of basis for its minor air quality permit application and the 2007 modification applications. The potential emissions may be observed in Table 4-1.

Table 4-1 Potential Emissions

Process	Particulate, tons/yr	VOCs, tons/yr	Ozone, tons/yr	HAPs, tons/yr
Existing Printing Operations	-	58.0	-	0.2
Proposed Printing Operations	-	19.0	-	-
Printing Operations Removed	-	- 25.7	-	- 0.1
Existing Extrusion Operations	21.3	14.0	-	1.1
Proposed Extrusion Operations	1.7	1.5	-	0.16
Existing Corona Treaters	-	-	2.5	-
Total Potential Emissions	**23.0**	**66.8**	**2.5**	**1.4**

5.0 PERMIT REQUIREMENTS

5.1 New Source Performance Standards

Presently, there are no finalized or promulgated New Source Performance Standards applicable to this type of operation.

5.2 New Source Review

ARSD 74:36:10:01 states that New Source Review (NSR) regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. Berry Plastics Corporation is located in Sioux Falls, South Dakota, which is in attainment or unclassifiable for all the pollutants regulated under the Clean Air Act. Therefore, Berry Plastics Corporation is not subject to new source review.

5.3 Prevention of Significant Deterioration

A prevention of significant deterioration (PSD) review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated pollutant. If the source is considered one of the 28 named PSD source categories listed in Section 169 of the federal Clean Air Act, the major source threshold is 100 tons per year of any regulated pollutant. The major source threshold for all other sources is 250 tons per year of any regulated pollutant.

Berry Plastics Corporation does not meet the 250 tons per year threshold and is not one of the 28 named PSD source categories. Therefore, Berry Plastics Corporation is considered a minor source for the prevention of significant deterioration program. Minor sources are not subject to a prevention of significant deterioration review.

5.4 National Emission Standards for Hazardous Air Pollutants

Presently, there are no finalized or promulgated National Emissions Standards for Hazardous Air Pollutants standards applicable to this type of operation.

5.5 Maximum Achievable Control Technology Standards

Berry Plastics Corporation is not a major source of hazardous air pollutants. Therefore, the operations at the facility are not subject to Maximum Achievable Control Technology requirements for major sources and there are no area source Maximum Achievable Control Technology standards applicable to this type of operation.

5.6 State Requirements

Any source operating in South Dakota that meets the requirements of the Administrative Rules of South Dakota (ARSD) 74:36:05:03 is required to obtain a Title V air quality permit. Berry Plastics Corporation's VOC emissions are less than 100 tons per year and HAP emissions are less than 10 tons per year for a single HAP and 25 tons per year of a combination of HAPs. Based on the emissions, Berry Plastics Corporation is considered a minor source.

5.6.1 State Particulate and Sulfur Dioxide Emission Limits

Particulate and sulfur dioxide emission limits are derived from ARSD 74:36:06. Berry Plastics does not operate a point source which emits particulate matter or sulfur dioxide. Therefore, the particulate and sulfur dioxide emission limits are not applicable.

5.6.2 Performance Tests

In accordance with ARSD 74:36:11:02, the Secretary of DENR may require a stack performance test if necessary to demonstrate compliance with the state's emission limits. At this time, DENR does not believe a stack performance test is warranted. However, permit conditions will be included in the draft permit that will allow DENR to require a stack performance test if DENR believes a stack performance test is necessary in the future to demonstrate compliance.

5.6.3 Compliance Assurance Monitoring

Compliance assurance monitoring is applicable to permit applications received on or after April 20, 1998, from major sources applying for an air quality permit. Berry Plastics Corporation's application was received after April 20, 1998. However, Berry Plastics Corporation is requesting a modification to a minor air quality operating permit. Therefore, compliance assurance monitoring is not applicable.

5.6.4 Periodic Monitoring

Periodic monitoring is required for each emission unit that is subject to an applicable requirement at a source subject to Title V of the federal Clean Air Act. Berry Plastics

Corporation has a minor air quality operating permit. Therefore, periodic monitoring is not applicable.

5.7 Summary of Applicable Requirements

A minor source is defined as any source with the potential to emit less than 100 tons per year of a criteria pollutant. A source operating in South Dakota that meets the definition of a minor source is required to obtain a minor air quality operating permit under ARSD 74:36:04. Berry Plastics Corporation will be required to operate within the requirements stipulated in the following regulations under the minor permit program:

- ARSD 74:36:04 – Operating Permits for Minor Sources;
- ARSD 74:36:11 – Performance Testing; and
- ARSD 74:36:12 – Control of Visible Emissions.

6.0 RECOMMENDATION

Based on information DENR received in the permit application, Berry Plastics Corporation's current minor air quality permit may be modified to include three additional flexographic printers, the removal of 16 existing printers, and the addition of four extrusion lines. See Appendix A for the proposed revisions to Berry Plastics Corporation's existing minor air quality permit.

Any questions on this review should be directed to Lisa Robinson, Natural Resources Engineer, with the Department of Environment and Natural Resources.

APPENDIX A

PROPOSED PERMIT MODIFICATION

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The following changes to the existing permit represent changes that meet the definition of a permit modification. Additions to the existing permit are represented in blue, bold, and underlined and deletions are represented in red with overstrikes. In the case where permit conditions are deleted or added between permit conditions, the permit conditions will be renumbered appropriately when the permit is issued.

1.0 STANDARD CONDITIONS

1.1 Construction and operation of source. In accordance with Administrative Rules of South Dakota (ARSD) 74:36:04:15(9), the owner or operator shall operate the units, controls, and processes as described in Table ~~#1~~ **1-1** and in accordance with the statements, representations, and supporting data contained in the complete permit application submitted and dated March 23, 2005, February 20, 2007, ~~and~~ October 11, 2007, **and March 26, 2010**, unless modified by the conditions of this permit. The application consists of the application forms, supporting data, and supplementary correspondence. If the owner or operator becomes aware that it failed to submit any relevant facts in a permit application or submitted incorrect information in an application, such information shall be promptly submitted.

~~Table #1~~

Table 1-1 – Description of Permitted Units, Operations, and Processes

Unit ~~Identification~~	**Description**	**Maximum Operating Rate**	**Control Device**
~~Unit~~ #1	~~Forty-three~~ **Forty seven** electrically heated extrusion lines. Two additional extruders may be installed during the term of this permit. The extruders are either blown film or internal bubble cooling. The extrusion lines exhaust to general ventilation or a vent associated with a particular extruder.	Not applicable	Not applicable
~~Unit~~ #2	~~Twenty-four~~ **Eleven** printers including ~~two~~ **one** Algen 36-inch box printer~~s;~~**,** ~~seventeen flexographic printers: nine~~ **two** 4-inch Matthews Model 5324, two 12-inch Matthews Model 5124, one 18-inch KIWI, ~~three~~ **four** 18-inch Bellmark, ~~and three 4-inch OMAL printers; and four inkjet printers.~~ **and one 13-inch Matthews.**	Not applicable	Not applicable
~~Unit~~ #3	Sixteen corona treaters.	Not applicable	Not applicable